L4 ANSWER 72 OF 74 FEDRIP COPYRIGHT 2005 NTIS on STN
AN 2005:140874 FEDRIP
NR AGRIC 0198453
TI **Mycotoxins** in Cereal **Grains**
SF Principal Investigator: (head blight)
Wolf-Hall, C.
CSP NORTH DAKOTA STATE UNIV, VETERINARY & MICROBIOLOGICAL SCIENCES, FARGO, NORTH DAKOTA, 58105
FU HATCH |c H
FS Department of Agriculture
SUM 3. Establish integrated strategies to manage and to prevent **mycotoxin** contamination in cereal **grains** Evaluation of physical, chemical and biological approaches for dealing with pre-harvest formed Fusarium mycotoxins and viable mycotoxigenic Fusarium spp. will be completed. Currently, we are evaluating electron-beam radiation and hot water for prevention of Fusarium growth and **mycotoxin** production during the malting of **barley**. We will also evaluate other radiant sources of energy for physical treatments, chemical treatments such as **hydrogen peroxide** and ozone, and biological methods such as addition of antifungal bacterial starter cultures.PR production and decreased malt quality. Methods for treatment of Fusarium infected barley may prevent these safety and quality defects and allow use of otherwise good quality barley. Gaseous ozone and **hydrogen peroxide** were evaluated for effectiveness in reducing Fusarium survival (FS) while maintaining germinative energy (GE) in barley. Gaseous ozone treatments (GOT) included concentrations of 11 and 26 mg/g for 0, 15, 30, and 60 minutes. **Hydrogen peroxide** (HP) treatments included 0, 5, 10, and 15% concentrations with exposure times of 0, 5, 10, 15, 20, and 30 minutes. For GOT, in naturally Fusarium-infected barley, a statistically significant ($P<0.05$) decrease (24-36%) of FS occurred within 15 minutes of exposure at either concentration. GE was significantly ($P<0.05$) affected by 30 minutes at both concentrations in naturally Fusarium infected barley, but not in sound barley. GOT did not cause any significant ($P>0.05$) effect on GE in sound barley at either concentration over the full 30 minute exposure time. For HP, FS was significantly decreased (50-98%) within 5 minutes of exposure. With the exception of two treatments (10% and 15% HP agitated for 20 minutes) GE was not statistically significantly different from the control in naturally Fusarium infected barley. In sound barley, HP had no significant ($P>0.05$) effect on GE. The results suggest that GOT and HP may have potential for treatment of Fusarium infected malting barley.PB

L4 ANSWER 73 OF 74 FEDRIP COPYRIGHT 2005 NTIS on STN
AN 2005:130389 FEDRIP
NR AGRIC 0185362
TI MARKETING AND DELIVERY OF QUALITY CEREALS AND OILSEEDS
SF Principal Investigator: (food quality)
Wolf-Hall, C.
CSP NORTH DAKOTA STATE UNIV, VETERINARY & MICROBIOLOGICAL SCIENCES, FARGO, NORTH DAKOTA, 58105
FU HATCH |c H
FS Department of Agriculture
SUM Objective C of NC-213 Regional Project: quantify and define quality of cereals and oilseeds for various end use markets. Sub-objective C3c: effects of processing on **molds** and **mycotoxins** in **grains**. Specific objectives under Sub-objective C3c: Sub-objective 1. To determine the effect of irradiation on five cultuvars of Fusarium infected **barley**. Sub-objective 2. To determine the **mycotoxin** producing ability of surviving Fusarium graminearum isolates taken from irradiated **barley**. Experimental Design Sub-objective 1. This will be a randomized complete block design. Five barley cultivars will be compared for the effect of irradiation on **barley** germination, Fusarium survival, and **mycotoxin**

content. Other variables will be the dosage of radiation (0, 2, 4, 6, 8 and 10 Kgy). The treatments will be repeated three times and the results compared. The barley samples showing the most significant decreases in Fusarium levels, while maintaining germinative ability will be malted and the malt tested for amylase activity and mycotoxin content. Sub-objective 2. This will be a completely random design. From the irradiated barley samples, 100 kernels of each will plated on growth medium to determine the mold populations and their survival rates over a range of irradiation dosages. Isolates representing Fusarium graminearum from the five barley cultivars treated at the different irradiation doses will be taken and grown under defined laboratory conditions. The mycotoxin producing ability will be determined by testing the cultures for DON, 3-acetylDON, 15-acetylDON, and zearalenone.PR malting barley. UV-C irradiation was not found to be effective in eliminating Fusarium infection. Hot water and electron-beam treatments were further studied. Hot water treatments included four temperatures (45, 50, 55, and 60 degrees C) for 0, 1, 5, 10, and 15 min, and electron-beam radiation included dosages of 0-11.4 kGy. For hot water treatments, at 45 degrees C, reductions in Fusarium infection (FI) averaged 97% after 10 and up to 15 min, with no significant reductions in germinative energy (GE). Significant reduction (25%) in GE occurred at 50 degrees C after 5 min, but FI was dramatically reduced after only 1 min. For temperatures 55 and 60 degrees C, significant reductions in GE were seen after 1 minute. With electron-beam radiation, significant reduction in the FI started between 2.3-4.7 kGy. Higher doses (9.2 kGy, and 11.4 kGy) achieved eradication of FI. GE decreased with increase in the electron-beam dosage over 4.5 kGy; however, there was a slight increase in GE at approximately 8 kGy where the GE was not significantly different from that at 0 kGy. We expanded our irradiation study to include different levels of Fusarium infection and malt quality analyses. Irradiation was done at a Surebeam Corporation plant, with dosages of 0, 2, 4, 6, 8 and 10 kGy. Treated samples were malted in a pilot-scale malting unit at North Dakota State University. **Barley** was analyzed for FI, GE, aerobic plate counts (APC), **mold** and yeast counts (MYC) and deoxynivalenol (DON). Malted **barley** samples were analyzed for FI, APC, MYC, and DON. FI decreased with increase in radiation dosage in both the barley and malted samples. In barley samples exposed to 10 kGy, FI was reduced by 50-98%. APC significantly decreased (1-5 logs) in barley with increase in irradiation dosage. A 5-log reduction in APC was observed at 10 kGy for all barley samples. MYC significantly decreased in barley with increase in irradiation dosage. A 1-2.5 log reduction in MYC was observed for all barley samples exposed to 10 kGy. DON was eliminated in malts from barley treated with 2 kGy and higher. APC and MYC in malts from 8-10 kGy treated barleys were slightly higher than in other malts indicating that radiation resistant microflora were able to thrive during malting due to decreased competition. GE in barley samples was significantly decreased (3-15%) at dosages of 8-10 kGy. The results suggest that dosages between 4-8 kGy may be effective in reducing DON in malt while maintaining the GE in barley. Dosages over 8 kGy reduce GE and appear to lead to higher microbial loads in malt. We also evaluated the effect of **hydrogen peroxide** on FI and GE in barley. Treatments included 0, 5, 10 and 15% **hydrogen peroxide** exposure for 0, 5, 10, 15, 20 and 30 minutes. In the 0% control, FI was decreased by 30% after 30 minutes. With 5% **hydrogen peroxide** there was a 79-95% decrease in FI between 5-30 minutes of exposure. GE was only negatively affected with treatments of 10 and 15% **hydrogen peroxide** exposed for 20 minutes.PB

L4 ANSWER 70 OF 74 CAPLUS COPYRIGHT 2005 ACS on STN
AN 1973:157878 CAPLUS
DN 78:157878
TI Disruption of **fungus** cells in fermentation by-products for use in animal **feeds**
IN Kikuchi, Tadaaki; Sugimoto, Hiroshi; Yokotsuka, Tamotsu
PA Kikkoman Shoyu Co., Ltd.
SO Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 48005990	B4	19730125	JP 1971-40122	19710609

AB Fungus cells were treated with 0.1-2.0% H2O2 solution at 110° for 10-60 min to disrupt cell walls. The treated cells with high protein contents were used in animal feeds.

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FILE 'HOME' ENTERED AT 15:06:32 ON 22 AUG 2005

=> file food
COST IN U.S. DOLLARS                                    SINCE FILE      TOTAL
                                                           ENTRY    SESSION
FULL ESTIMATED COST                                         0.21       0.21

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FILE 'TOXCENTER' ENTERED AT 15:06:43 ON 22 AUG 2005
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=> s (mycotoxin or fungus or mold) and (grain or barley or wheat or feed)
  13 FILES SEARCHED...
L1        156009 (MYCOTOXIN OR FUNGUS OR MOLD) AND (GRAIN OR BARLEY OR WHEAT OR
                 FEED)

=> s l1 and hydrogen peroxide
L2            511 L1 AND HYDROGEN PEROXIDE

=> s s (mycotoxin or fungus or mold) (10a) (grain or barley or wheat or feed) and
hydrogen peroxide
MISSING OPERATOR 'S (MYCOTOXIN'
The search profile that was entered contains terms or
nested terms that are not separated by a logical operator.

=>  s (mycotoxin or fungus or mold) (10a) (grain or barley or wheat or feed) and
hydrogen peroxide
  13 FILES SEARCHED...
L3            139 (MYCOTOXIN OR FUNGUS OR MOLD) (10A) (GRAIN OR BARLEY OR WHEAT
                  OR FEED) AND HYDROGEN PEROXIDE

=> dup rem l3
DUPLICATE IS NOT AVAILABLE IN 'FEDRIP, FOREGE, NUTRACEUT'.
ANSWERS FROM THESE FILES WILL BE CONSIDERED UNIQUE
PROCESSING COMPLETED FOR L3
L4             74 DUP REM L3 (65 DUPLICATES REMOVED)

=> d 1-74 bib ab
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=> d his

     (FILE 'HOME' ENTERED AT 15:06:32 ON 22 AUG 2005)

     FILE 'AGRICOLA, BIOSIS, BIOTECHNO, CABA, CAPLUS, DISSABS, FEDRIP, FOMAD,
     FOREGE, FROSTI, FSTA, JICST-EPLUS, NTIS, NUTRACEUT, PASCAL, PROMT,
     SCISEARCH, TOXCENTER' ENTERED AT 15:06:43 ON 22 AUG 2005
L1       156009 S (MYCOTOXIN OR FUNGUS OR MOLD) AND (GRAIN OR BARLEY OR WHEAT O
L2          511 S L1 AND HYDROGEN PEROXIDE
L3          139 S (MYCOTOXIN OR FUNGUS OR MOLD) (10A) (GRAIN OR BARLEY OR WHEAT
L4           74 DUP REM L3 (65 DUPLICATES REMOVED)

=>
=> s (mycotoxin or fungus or mold) (10a) hydrogen peroxide (20a) (grain or barley
or wheat or sorghum)
  12 FILES SEARCHED...
L5           38 (MYCOTOXIN OR FUNGUS OR MOLD) (10A) HYDROGEN PEROXIDE (20A)
                (GRAIN OR BARLEY OR WHEAT OR SORGHUM)

=> dup rem l5
DUPLICATE IS NOT AVAILABLE IN 'FEDRIP, FOREGE, NUTRACEUT'.
ANSWERS FROM THESE FILES WILL BE CONSIDERED UNIQUE
PROCESSING COMPLETED FOR L5
L6           24 DUP REM L5 (14 DUPLICATES REMOVED)
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=> d his

     (FILE 'HOME' ENTERED AT 15:06:32 ON 22 AUG 2005)

     FILE 'AGRICOLA, BIOSIS, BIOTECHNO, CABA, CAPLUS, DISSABS, FEDRIP, FOMAD,
     FOREGE, FROSTI, FSTA, JICST-EPLUS, NTIS, NUTRACEUT, PASCAL, PROMT,
     SCISEARCH, TOXCENTER' ENTERED AT 15:06:43 ON 22 AUG 2005
L1        156009 S (MYCOTOXIN OR FUNGUS OR MOLD) AND (GRAIN OR BARLEY OR WHEAT O
L2           511 S L1 AND HYDROGEN PEROXIDE
L3           139 S (MYCOTOXIN OR FUNGUS OR MOLD) (10A) (GRAIN OR BARLEY OR WHEAT
L4            74 DUP REM L3 (65 DUPLICATES REMOVED)
L5            38 S (MYCOTOXIN OR FUNGUS OR MOLD) (10A) HYDROGEN PEROXIDE (20A) (
L6            24 DUP REM L5 (14 DUPLICATES REMOVED)
L7            13 S (FUNGUS OR MOLD OR MYCOTOXIN)(10A) HYDROGEN PEROXIDE (20A) (S
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Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	283	(fungus or mold or mycotoxin) and hydrogen adj peroxide and (feed or brley or sorghum or corn or wheat or fodder or hay or silage)	USOCR	OR	ON	2005/08/22 15:50
L2	116	((fungus or mold or mycotoxin) same hydrogen adj peroxide) and (feed or barley or sorghum or corn or wheat or fodder or hay or silage)	USOCR	OR	ON	2005/08/22 16:14
L3	251	((fungus or mold or mycotoxin) same hydrogen adj peroxide) and (feed or barley or sorghum or corn or wheat or fodder or hay or silage)	US-PGPUB; USPAT	OR	ON	2005/08/22 16:14
L4	0	((fungus or mold or mycotoxin) same hydrogen adj peroxide) and (feedstuff)	USOCR	OR	ON	2005/08/22 16:14
L5	252	((fungus or mold or mycotoxin) same hydrogen adj peroxide) and (feed or feedstuff or barley or sorghum or corn or wheat or fodder or hay or silage)	US-PGPUB; USPAT	OR	ON	2005/08/22 16:29
L6	6	("3979283" | "4478683" | "4554075" | "4588506" | "4623465" | "4665926").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2005/08/22 16:20

L7	16	((fungus or mold or mycotoxin) same hydrogen adj peroxide) and (feed or feedstuff or barley or sorghum or corn or wheat or fodder or hay or silage)	EPO; JPO; DERWENT	OR	ON	2005/08/22 16:31
L8	6	((fungus or mold or mycotoxin) same hydrogen adj peroxide) same spray$3	EPO; JPO; DERWENT	OR	ON	2005/08/22 16:31
L9	35	((fungus or mold or mycotoxin) same hydrogen adj peroxide) same spray$3	US-PGPUB; USPAT	OR	ON	2005/08/22 16:34
L10	98	((fungus or mold or mycotoxin) same hydrogen adj peroxide) same spray$3	USOCR	OR	ON	2005/08/22 16:35
L11	1	((fungus or mold or mycotoxin) with hydrogen adj peroxide) with spray$3	USOCR	OR	ON	2005/08/22 16:35